III.

EXISTING SETTING

A. INTRODUCTION

To determine the significance of the impacts associated with a proposed project, CEQA requires that a project's impacts be evaluated against the backdrop of the environment as it exists at the time the NOP is published. The CEQA Guidelines defines "environment" as "the physical conditions that exist within the area which will be affected by a proposed project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance" (CEQA Guidelines §15360; see also Public Resources Code §21060.5). An EIR must also include a description of the physical environment in the vicinity of the project as it exists at the time the NOP is published, from both a local and regional perspective (CEQA Guidelines §15125). Therefore, the "environment" or "existing setting" against which a project's impacts are compared consists of the immediate, contemporaneous physical conditions at and around the project site (Remy *et al*., 1996). The NOP/IS for the architectural coatings SCM identified six environmental topic areas that could potentially be adversely affected by implementation of architectural coatings rules based on the SCM—air quality, water, public services, transportation/circulation, solid waste/hazardous waste, and hazards. This chapter includes a discussion of the physical and regulatory setting for each of the six areas.

B. AIR QUALITY

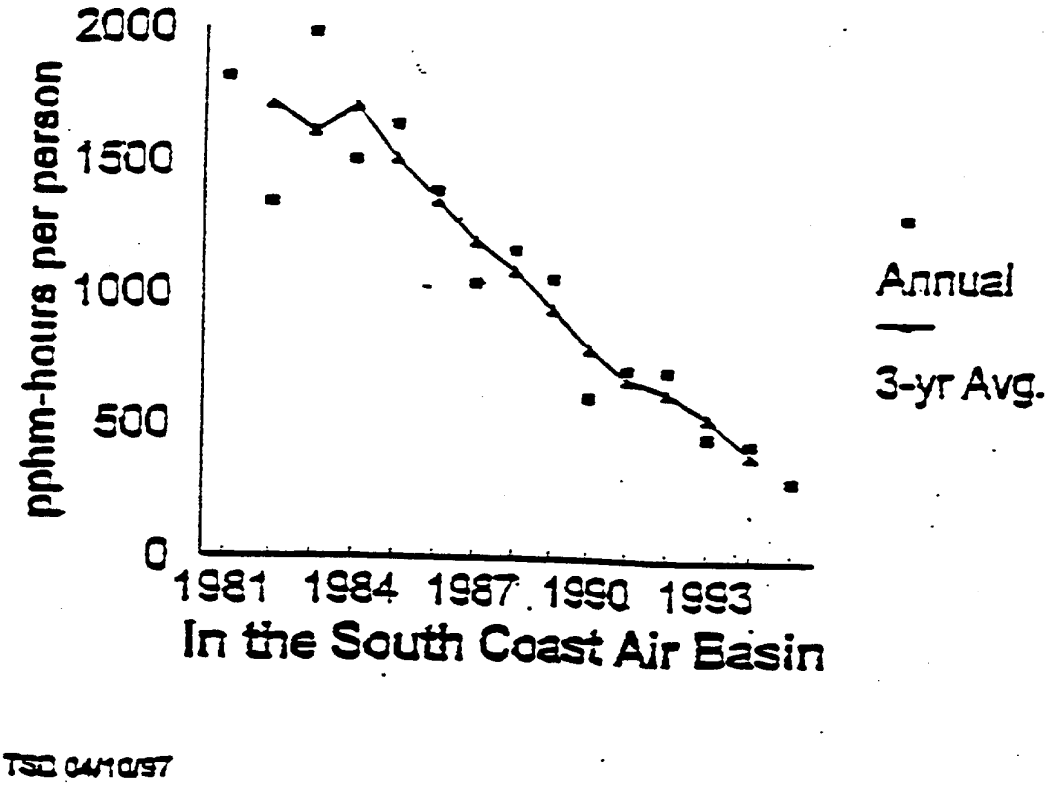
1. Ambient Air Quality and the Need for Emission Reductions

Ozone

VOC emissions contribute to the formation of both ozone and PM_{10} (particulate matter less than 10 microns equivalent aerodynamic diameter). Ozone formation in the lower atmosphere results from a series of chemical reactions between VOCs and nitrogen oxides in the presence of sunlight. PM_{10} is the result of both direct and indirect emissions. Direct sources of PM_{10} include emissions from fuel combustion and wind erosion of soil. Indirect PM_{10} emissions result from the chemical reaction of VOCs, nitrogen oxides, sulfur oxides and other chemicals in the atmosphere.

VOCs and nitrogen oxides (NO_x) react in the presence of sunlight to form ozone. The rate of ozone generation is related closely to the rate of VOC production (in the form of reactive organic gases, or ROG) as well as the availability of NO_x in the atmosphere (U.S. EPA, 1996; Seinfeld and Pandis, 1998). At low ambient concentrations, ozone is a colorless, odorless gas, and the chief component of urban smog. It is by far California's most persistent and widespread air quality problem. Air quality data have revealed that 75 percent of the nation's exposure to ozone occurs in California (ARB, 1994a). As shown in Figure III-1, the population-weighted

Figure III-1
Population-Weighted Exposure to Ozone Concentrations
Above the State Ambient Air Quality Standard



average exposure to ozone concentrations above the State ambient air quality standard of nine parts per hundred million (pphm) in the South Coast Air Basin has been declining. However, despite this decline and nearly 25 years of regulatory efforts, ozone continues to be an important environmental and health concern.

It has been well documented that ozone adversely affects the respiratory functions of humans and animals. Human health studies show that short-term exposure to even very low levels of ozone injures the lung (ARB, 1997; U.S. EPA, 1996). Ozone is a strong irritant that can cause constriction of the airways, forcing the respiratory system to work harder in order to provide oxygen to the body. Besides shortness of breath, it can aggravate or worsen existing respiratory diseases such as emphysema, bronchitis, and asthma (U.S. EPA, 1996).

Chronic exposure to ozone may cause permanent damage in deep portions of the lung. In some animal studies, permanent structural changes due to long-term ozone exposure were noted. These changes remained even after periods of exposure to clean air (U.S. EPA, 1996). The ARB is currently conducting a study to determine the effects of ozone on lung development. The "Epidemiologic Investigation to Identify Chronic Health Effects of Ambient Air Pollutants in Southern California" is a long-term study which is documenting the lung development of children in 12 cities in California. The air quality in these 12 communities varies from good to moderate and poor, so any trends in lung development may be determined. Preliminary results of this on-going study do indicate that chronic ozone exposure slows lung development.

Not only does ozone adversely affect human and animal health, but it also affects vegetation throughout most of California resulting in reduced yield and quality in agricultural crops and disfiguration or unsatisfactory growth in ornamental vegetation. During the summer, ozone levels are often highest in the urban centers in Southern California, the San Joaquin Valley, and Sacramento Valley, which are adjacent to the principal production areas in California's multibillion-dollar agricultural industry. ARB studies indicate that ozone pollution damage to crops is estimated to cost agriculture over 300 million dollars annually (ARB, 1987a). Similarly, the U.S. EPA estimates national agricultural losses to exceed 1 billion dollars annually (U.S. EPA, 1996).

PM_{10}

Airborne particulate matter (PM_{10}) is a solid or liquid substance with less than (<) 10 microns determined as the equivalent aerodynamic diameter. PM_{10} can be directly emitted into the atmosphere as the result of anthropogenic actions such as fuel combustion or natural causes such as wind erosion. Indirect PM_{10} is formed via a complex reaction involving a gas-to-particulate matter conversion process in which VOCs can participate (Seinfeld and Pandis, 1998). The focus of this discussion will be on the indirect aerosol formation of $PM_{10.}$

PM_{10} is composed of up to 35 percent aerosols which may be the result of atmospheric chemical reactions of sulfate, nitrates, ammonium, trace metals, carbonaceous material (VOCs), and water. The products of the gas-phase reactions may combine to form new particles (either single or two or more vapor phase species) or increase existing particle growth by condensation of VOCs (Seinfeld and Pandis, 1998). Furthermore, although the contribution from VOCs is not known, carbonaceous aerosols generally account for a significant fraction of the fine (<2 micron equivalent aerodynamic diameter) urban particulate matter. In Los Angeles, for example, aerosol carbon alone accounts for about 40 percent of the total fine particulate mass (Seinfeld, 1989).

PM_{10}, and specifically, its smaller fraction, $PM_{2.5}$, are inhaled deep into the lungs, causing significant adverse health effects. The particulate matter irritates the respiratory tract, and may contain toxic as well as carcinogenic compounds (Godish, 1991). Epidemiologic evidence indicate that certain populations are particularly sensitive to PM_{10}, including the elderly, persons suffering from lung or cardiopulmonary disease, infants and children, and asthma sufferers. These populations suffer a range of health effects. Among children, decrements in lung function occur, leading to increased school absences, and asthmatic individuals may suffer from increased

respiratory symptoms. Among the elderly and in individuals suffering from cardiopulmonary disease, excacerbations of chronic disease leading to increased hospital admissions are seen (U.S. EPA, 1997). Because it is visible in the atmosphere, PM_{10} also contributes to reduced visibility.

To protect California's population from the harmful effects of ozone and PM_{10}, federal and State air quality standards for these contaminants have been established. These standards are shown in Table III-1. The State hourly ozone standard is nine pphm and the national hourly ozone standard is 12 pphm. The State PM_{10} standard for a 24-hour period is 50 micrograms per cubic meter ($\mu g/m^3$), and the national standard is 150 $\mu g/m^3$ over a 24-hour period.

TABLE III-1
AMBIENT AIR QUALITY STANDARDS FOR OZONE AND PM_{10}

Pollutant	Averaging Time	State Standard	National Standard
Ozone	1 hour	9 pphm ($180\ g/m^3$)	12 pphm ($235\ g/m^3$)
PM_{10}	Annual Geometric Mean	$30\ g/m^3$	--------
	24 hour	$50\ g/m^3$	$150\ g/m^3$
	Annual Arithmetic Mean	-------	$50\ g/m^3$

In 1997, the U.S. EPA promulgated a new national eight-hour ozone standard, and new national standards for particulate matter (PM_{10} and $PM_{2.5}$). On May 14, 1999, the U.S. Court of Appeals for the District of Columbia put implementation of the new standards on hold. The Court ruled that the agency had overstepped its constitutional authority in setting the new standards because, among other things, it did not clearly articulate the rationale used in selecting specific levels for the standards. The Court remanded all of the standards to the U.S. EPA for further consideration. During remand, the status of the standards is as follows: (1) the Court vacated the new PM_{10} standard, (2) the Court left the new eight-hour ozone standard in place, but held that the standard "cannot be enforced," and (3) the Court will decide in the future whether the $PM_{2.5}$ standard should be vacated outright, or remain in place while the case is remanded to the U.S. EPA. The U.S. EPA appealed the court's decision to the full U.S. Court of Appeals; however, a narrowly divided Court let stand the decision. U.S. EPA now intends to ask the Supreme Court to review the decision.

The court decision has no immediate impact on California's air quality programs, because most of California continues to violate the pre-existing national and State one-hour ozone and PM_{10} standards, and the court decision did not affect the applicability of these standards. The pre-existing national one-hour ozone and PM_{10} standards continue to apply. California's State standards continue to apply. (In general terms, California's one-hour ozone standard is similar in its impact to the new federal eight-hour standard.) Regardless of the ultimate legal fate of the new federal standards, ARB and the districts will need to pursue new emission reduction measures to attain the existing standards. Given this situation, as well as the

unsettled legal status of the new national standards, this Program EIR will not further discuss the new standards.

The vast majority of California's population who live in urban areas breathe unhealthy air for much of the year, as clearly shown in Figure III-2 (ARB, 1998). Lastly, Figures III-3 and III-4 show that unhealthy levels of ozone and PM_{10}, respectively, are not limited to just urban areas, but can be found in nearly every county in California. As shown in these maps, 46 counties are currently designated as nonattainment for the State ozone standard, while 55 counties are designated as nonattainment for the State PM_{10} standard (ARB, 1999). These counties contain over 97 and 99 percent, respectively, of California's population, a clear indication of the extent and magnitude of the ozone and PM_{10} problems in California.

2. Strategy for Attaining the National and State Ozone Standards

The California Clean Air Act requires districts that have been designated nonattainment for the State ambient air quality standards for ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide to prepare and submit plans for attaining and maintaining the standards (see Health and Safety Code §40910 *et seq*.). In addition, the federal Clean Air Act requires that districts designated nonattainment for the federal ambient air quality standards prepare State Implementation Plans to demonstrate attainment with the federal standards. In some of these districts, substantial additional emission reductions will be necessary if attainment is to be achieved. In developing their plans, each district determines which measures are necessary to include, as well as the specific details of each included measure.

The plans from various districts underscore the increasing role of pollution from areawide sources, including consumer products and architectural coatings. As emissions from facilities and vehicles are reduced, the widespread areawide sources become a larger part of the inventory, and are included as a more significant area for potential reductions of VOC emissions. It is estimated that without additional architectural coatings regulations, the inventory for architectural coatings emissions will increase due to population growth. Implementation of the SCM would result in VOC emission reductions of approximately 12 tons per day statewide, excluding the SCAQMD, and would realize an additional 0.15 ton per day reduction in the SCAQMD (from the interim limits).

Figure III-2
California Exceedences of
State Ambient Air Quality Standards During 1997

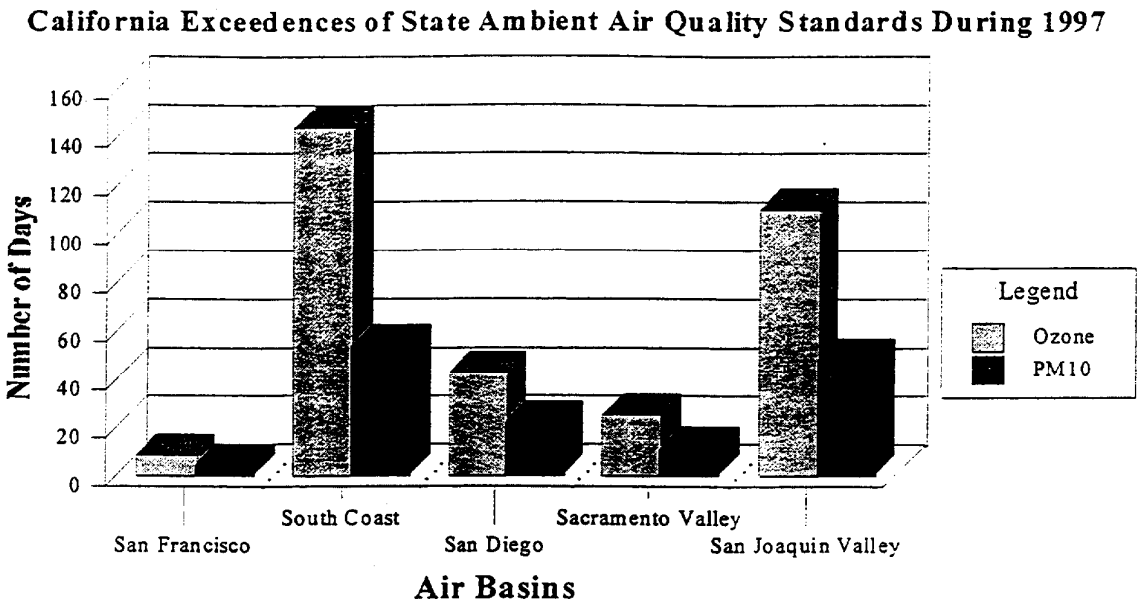


Figure III-3
Area Designations for State Ambient Air Quality Standard for Ozone

Figure III-4
Area Designations for State Ambient Air Quality Standard for PM_{10}

3. Climate[1]

California is approximately 800 miles in length and spreads over 10 degrees in latitude. Altitude ranges from 276 feet below sea level in Death Valley to 14,495 feet above sea level at the summit of Mt. Whitney. These wide ranges of altitude and latitude are responsible in part for the variety of climates found throughout California. Another significant factor is the continuous interaction of maritime air masses with those of continental origin. Along the western side of the Coast Range, the climate is dominated by the Pacific Ocean. Warm winters, cool summers, small daily and seasonal temperature ranges, and high relative humidities are characteristic. Areas more distant from the ocean experience a more continental climate with warmer summers, colder winters, greater daily and seasonal temperature ranges, and generally lower humidities.

Seasonal and daily temperatures are more uniform on the ocean side of the Coast Range and in coastal valleys. In San Diego, for example, the average monthly temperature in January is 55^{o} (all temperatures in this section are in degrees Fahrenheit), while the August reading is only 72^{o}. In Eureka, the January mean is 47^{o} and the August mean is 57^{o}. East of the Sierra Nevada temperature patterns are continental in character with wide variations. In Bishop, the January mean temperature is 39^{o} and the July mean is 77^{o}. Between the two mountain ranges and over much of the desert areas, the temperature regime is intermediate with hot summers and moderate to cold winters.

The average length of the growing season, as limited by occurrences of 32^{o} temperatures, ranges from 365 days along the southern coast to less than 50 days at high elevations of the Sierra Nevada. Most coastal valleys and the Central Valley have a freeze-free season of 225 to 300 days. In the southeastern deserts, the growing season is from 250 to 325 days long, but the season is limited to 100 to 125 days in the northeastern interior.

In general, relative humidities are moderate to high along the coast throughout the year. Inland humidities are high during the winter and low during summer. Where mountain barriers prevent the free flow of marine air inland, humidities decrease rapidly. The Mojave and Colorado Deserts experience very low humidities with the high temperatures of summer. Winter readings are generally moderate to low. The Sacramento and San Joaquin Valleys have characteristically low humidities except in the Delta area where a strong inflow of marine air during the summer creates a transition zone intermediate between the high humidities of the coast and the low readings of the interior.

Annual precipitation totals in excess of 50 inches are characteristic of the west slope of the Sierra Nevada north of Stockton, the west slope of the Coast Range from Monterey County northward (with the exception of the Monterey Bay and San Francisco Bay areas), and parts of the Cascades. In the lee of the Coast Range, yearly amounts drop off to 15 inches in parts of the Sacramento Valley and to less than eight inches over most of the San Joaquin Valley. The northeast interior portion of California receives from 15 to 18 inches of moisture per year.

In the mountains of southern California, annual rainfall totals reach 30 to 40 inches, while the coastal plain receives only 10 to 15 inches. The southeast desert receives as little as two to

[1] Source: Elford, 1970.

five inches per year. The extreme range within California is represented by an annual total of less than two inches in Death Valley and by more than 100 inches in portions of the Coast Range near the Oregon border.

In Northern California, the months of heaviest precipitation are October through April. In Eureka, for example, 90 percent of the annual rainfall falls in this period. The rainy season becomes shorter in Southern California, with 83 percent of the rainfall occurring from November through March. In the north and over the central and northern mountains there are usually from 60 to 100 days of precipitation per year, while in the southern desert there may be as few as 10 days.

Snow has been reported in nearly every part of California, but it is very infrequent west of the Sierra Nevada except at high elevations of the Coast Range and Cascades.

Prevailing airflow over California is from the west or northwest much of the year. However, the mountain ranges deflect these winds and except for the immediate coast, wind direction is more influenced by local terrain than prevailing air circulation.

C. WATER

1. Water Supply

Water supplies are classified into three broad groups by the Department of Water Resources (DWR): surface water, groundwater, and recycled/desalted water (DWR, 1998). Surface water sources include developed supplies from the Central Valley Project (CVP), State Water Project (SWP), Colorado River, other federal projects, and local projects.

The CVP, built in the 1940s, is the largest water storage and transfer system in California. The CVP stores up to 12 million acre feet (maf) and delivers 7.3 maf annually to more than 250 long-term water contractors. The majority of CVP water goes to agricultural users, although a number of large urban centers in the Central Valley also receive CVP water.

About 20 million Californians get some portion of their water from the SWP, California's major distribution system for urban water supplies. The 29 water agencies that buy SWP water have contracted for long-term deliveries of about four maf of water per year. Existing facilities, however, only allow the SWP to deliver about 2.4 maf in a normal water year and 1.1 maf in dry years.

The Colorado River provides water to seven states including California, with each state's water use determined by the Colorado River Compact of 1922. Currently, California's basic apportionment of Colorado River water is 4.4 maf. However, due to above-normal runoff in the Colorado River Basin, and the states of Arizona and Nevada not taking their full apportionment, California has received an average of 4.8 maf per year in recent years.

Groundwater includes developed subsurface supplies and water reapplied through deep percolation. California's groundwater reserves provide about 25-30 percent of California's usable water supply in normal years and up to two-thirds of the supply in critically dry years.

Water recycling is another important technology to make better use of existing water resources. More than half of California's recycled water is used for agricultural irrigation. About 20 percent is used for groundwater recharge and 16 percent is used for landscape irrigation. Recycled water is also increasingly being used by industry in cooling processes and for other purposes. DWR projects the amount of recycled water will increase from about 485,000 acre-feet in 1995 to over 1.4 maf by 2020.

The capacity of California's existing desalting plants totals about 66,000 acre-feet annually; feedwater sources are brackish groundwater, wastewater, and seawater. Total seawater desalting capacity is currently about 8,000 acre-feet per year statewide. Most existing plants are small (less than 1,000 acre-feet per year) and have been constructed in coastal communities with limited water supplies. The supply of desalted seawater is expected to remain constant at 8,000 acre-feet per year through 2020.

Local water districts are the primary water purveyors in California. These water districts receive some of their water supply from surface and groundwater resources within their respective jurisdictions, with any shortfall made up from supplemental water purveyors. In some cases, 100 percent of a local water district's water supply may come from supplemental sources. Several groundwater basins in California are threatened by overdraft conditions, increasing levels of salinity, and contamination by toxics or other pollutants. Local supplies may also be reduced by conversion of agricultural land to urban development, thereby reducing the land surface available for groundwater recharge. Increasing demand for groundwater may also be limited by water quality, since levels of salinity in sources currently used for irrigation could be unacceptably high for domestic use without treatment.

2. Water Demand

California is divided into 10 hydrologic regions, corresponding to California's major drainage basins. Table III-2 summarizes average and drought year water supply and demand by hydrologic region in 1995 and 2020, assuming as a worst-case scenario that there are no changes to existing facilities and programs.

DWR estimates that California's total water demand, based on the planning year 1995, is approximately 80 maf in average years and 65 maf in drought years. California's water demand in 2020 is forecasted to reach 81 maf in average years and 66 maf in drought years. California's increasing population is a driving force behind increasing water demands. California's population was more than 32 million in 1995 and is expected to increase by an additional 15.5 million by 2020. Even with water management options that are likely to be implemented, the gap between water supply and demand is projected to total 0.2 maf during normal years and up to 2.7 maf in drought years by 2020.

The largest urban water use is in the South Coast Region where roughly half of California's population resides. Several major conveyance systems bring water to the urbanized portion of the region from northern California via the SWP, the Sierra Nevada via the Los Angeles Aqueduct, and the Colorado River via the Colorado River Aqueduct. The All-American/ Coachella Canals deliver agricultural irrigation water from the Colorado River to the Coachella Valley. The continued availability of water from these sources is uncertain at current levels of development.

3. Water Quality

California has an extensive regulatory program to control water pollution. The most important statute governing water quality is the Porter-Cologne Act, which gives the State Water Resources Control Board (SWRCB) and the nine regional water quality control boards (RWQCB) broad powers to protect surface and groundwater supplies in California, regulate waste disposal, and require cleanup of hazardous conditions (California Water Code §§3000-13999.16). In particular, the SWRCB establishes water-related policies and approves water quality control plans, which are implemented and enforced by the RWQCBs. The nine regional boards include: North Coast, San Francisco Bay, Central Coast, Los Angeles, Central Valley, Lahontan, Colorado River Basin, Santa Ana, and San Diego.

It is the responsibility of each regional board to prepare water quality control plans to protect surface and groundwater supplies within its region. These plans must identify important regional water resources and their beneficial uses, such as domestic, navigational, agricultural, industrial, and recreational; establish water quality objectives, limits, or levels of water constituents or characteristics established for beneficial uses and to prevent nuisances; and present an implementation program necessary to achieve those water quality objectives. These plans also contain technical information for determining waste discharge requirements and taking enforcement actions. The plans are typically reviewed and updated every three years (California Water Code §13241).

California dischargers of waste that "could affect the quality of the waters of the State" are required to file a report of waste discharge with the appropriate regional water board (California Water Code §13260). The report is essentially a permit application and must contain information required by the regional board. After receipt of a discharge report, the regional board will issue "waste discharge requirements" analogous to a permit with conditions prescribing the allowable nature of the proposed discharge (California Water Code §§3263, 13377, and 13378).

TABLE III-2
PROJECTED WATER SUPPLY AND DEMAND BY HYDROLOGIC REGION (taf)*

Region	**1995**						**2020**					
	Average Year			Drought Year			Average Year			Drought Year		
	Supply	Demand	Shortage	Supply	Demand	Shortage	Supply	Demand	Shortage	Supply	Demand	Shortage
North Coast	20,607	20,607	0	10,491	10,668	177	20,672	20,672	0	10,546	10,722	176
San Francisco Bay	7,115	7,115	0	5,412	5,760	349	7,176	7,176	0	5,773	5,773	0
Central Coast	1,381	1,595	214	1,328	1,610	282	1,592	1,592	0	1,519	1,620	100
South Coast	5,224	5,224	0	4,775	5,283	508	5,994	5,993	0	6,090	6,090	0
Sacramento River	14,553	14,664	111	13,239	14,106	867	14,918	14,917	0	13,560	14,282	722
San Joaquin River	10,757	10,996	239	8,943	9,731	788	10,814	10,813	0	8,949	9,607	658
Tulare Lake	12,228	13,098	870	9,663	11,525	1,862	12,678	12,880	202	10,558	11,426	868
North Lahontan	942	942	0	752	880	128	950	960	10	773	901	128
South Lahontan	587	676	89	559	651	92	926	927	0	901	901	0
Colorado River	4,506	4,575	69	4,479	4,574	95	4,152	4,152	0	4,151	4,151	0
Total	**77,900**	**79,492**	**1,592**	**59,641**	**64,788**	**5,147**	**79,872**	**80,082**	**212**	**62,820**	**65,473**	**2,653**

* taf = thousand acre feet

a. National Pollution Discharge Elimination System Requirements

Most discharges into California's waters are regulated by the National Pollution Discharge Elimination System (NPDES), a regulatory program under the federal Clean Water Act. The NPDES is supervised by U.S. EPA, but administered by the SWRCB. NPDES requirements apply to discharges of pollutants into navigable waters from a point source, discharges of dredged or fill material into navigable waters, and the disposal of sewage sludge that could result in pollutants entering navigable waters. California has received U.S. EPA approval of its NPDES program. Pursuant to California's NPDES program, any waste discharger subject to the NPDES program must obtain an NPDES permit from the appropriate RWQCB. The permits typically include criteria and water quality objectives for a wide range of constituents. The NPDES program is self-monitoring, requiring periodic effluent sampling. Permit compliance is assessed monthly by the local RWQCB and any NPDES violations are then categorized and reported to U.S. EPA on a quarterly basis.

U.S. EPA has also published regulations that require certain industries, cities and counties to obtain NPDES permits for stormwater discharges [(55 CFR (1990)]. The new regulations set forth permit application requirements for classes of stormwater discharges specifically identified in the federal Clean Water Act. The regulated stormwater discharges include those associated with industrial activity and from municipal storm sewer systems serving a population of 100,000 or more.

b. Discharges to Publicly Owned Treatment Works (POTWs)

Water discharges to a public sewage system (referred to generically as a POTW), rather than directly to the environment, are not subject to the NPDES discharge requirements. Instead, such discharges are subject to federal pretreatment requirements under §§307(b) and (c) of the Clean Water Act [33 USC §1317(b)-(c)]. Although these pretreatment standards are enforced directly by U.S. EPA, they are implemented by local sanitation districts (Monahan *et al.*, 1993). The discharger, however, has the responsibility to ensure that the waste stream complies with the pretreatment requirements of the local system. Any facility using air pollution control equipment affecting water quality must receive a permit to operate from the local sanitation district. In cases where facilities modify their equipment or install air pollution controls that generate or alter existing wastewater streams, owner/operators must notify the local sanitation district and request that their existing permit be reviewed and modified.

To ensure compliance with wastewater pretreatment regulations, local sanitation districts sample and analyze the wastewater streams from facilities approximately two to four times per year. Persons who violate California's water quality laws are subject to a wide array of enforcement provisions. In 1990, U.S. EPA revised and extended existing regulations to further regulate hazardous waste dischargers and require effluent testing by POTWs. To comply with revised permit limits, POTWs may alter their operations or impose more stringent local limits on industrial user discharges of hazardous wastes (Monahan *et al.*, 1993). POTWs in California are operated by sanitation districts that adopt ordinances establishing permit systems and fee structures. There are 630 POTWs in California.

D. PUBLIC SERVICES

Public services include fire protection, police protection, schools, parks, and other public services and facilities administered by local, regional, state, and federal government agencies.

1. Fire Protection

Fire protection consists of fire fighting, paramedical care, fire detection, and building and fire code inspection. In addition, fire protection agencies are usually the first to respond to an emergency release of hazardous materials. City and county fire departments generally provide these services with some cities contracting with the counties for services. The U.S. Forest Service provides fire protection on 23 million acres of national forest and other lands. The California Department of Forestry and Fire Protection (CDF) is directly responsible for wildland fire protection of over 31 million acres of California's privately owned watershed lands. In addition, the department provides full fire service protection to nearly 11 million acres under reimbursement agreements with local governments. The department cooperates with federal and local government fire fighting agencies and the Governor's Office of Emergency Services (OES).

As of 1994, over 43,000 personnel were employed by 522 local fire departments throughout California (State Fire Marshal, 1994). Response times vary according to many factors, such as size of area covered, distance from station, time of day, and road congestion. In the South Coast region, for example, average response times vary from four to 15 minutes for emergency medical service and from three to 15 minutes for structure incidence fires (SCAG, 1993). Response times are often longer in rural areas than in suburban and urban areas.

2. Police Protection

As of 1996, there were approximately 70,000 full-time law enforcement officers employed in California, yielding a ratio of 22 officers per 10,000 civilians (Reaves and Goldberg, 1998). Most cities in California maintain their own police departments, although some cities contract with county sheriff's departments or nearby larger cities for police services. Unincorporated areas receive police protection from county sheriff's departments. The California Highway Patrol (CHP) provides law enforcement services on State and interstate highways. The CHP also provides backup services, along with county sheriff's departments, on federal lands such as national forests and Bureau of Land Management land. State rangers protect State parks and recreation areas.

3. Schools

There are 8,331 K-12 public schools in California with a total enrollment of 5,884,111 (approximately 28 percent of which is in Los Angeles County) (CBEDS, 1999). The capacity of school facilities to accommodate the student population is directly affected by increases in school enrollment. The process of constructing or modernizing a school building originates with and is the responsibility of the 1,055 individual school districts. The school district determines the type and size of the school building utilizing criteria set forth from the California Department

of Education. The size is also determined by the number of students to be housed in the facility, and consideration of health and safety issues designated by the appropriate State agencies.

At the post secondary level, California has 106 community colleges with an enrollment of over 1,000,000; 28 California State University campuses with an enrollment of over 340,000; and nine University of California campuses with an enrollment of over 165,000.

4. Parks and Recreation Areas

Numerous parks and recreational areas are maintained at the city, county, and regional levels throughout California. The California Department of Parks and Recreation administers 263 units and properties within the California State Parks system. California's 18 national forests are administered by the U.S. Forest Service, while the National Park Service maintains 23 different units including nine national parks. Other federal agencies that manage recreation areas in California include the Bureau of Land Management, U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, and U.S. Fish and Wildlife Service.

5. Other Public Facilities

Other public facilities include libraries, museums, courts, prisons, airports, harbors, public roads, transportation systems, bridges, and water, wastewater, drainage, and solid waste disposal systems. These facilities are administered by various government agencies at different levels.

E. TRANSPORTATION/CIRCULATION

Many agencies share authority for transportation planning and operations in California. These agencies include regional transportation planning agencies (RTPAs), county transportation authorities, local government transportation departments, and Caltrans. For purposes of air quality planning, RTPAs and air districts generally share responsibility for developing transportation measures to achieve air quality objectives.

Federally designated metropolitan planning organizations (MPOs) are required to adopt and periodically update long-range transportation plans for their areas of jurisdiction [(title 23 USC §134(g)(1)]. RTPAs are also required, under §65080 of the Government Code, to prepare regional transportation plans (RTPs) for their areas. These subsections also specify that actions by transportation agencies must be consistent with an adopted RTP that conforms with air quality requirements in order to obtain federal and state funding. Under the federal Clean Air Act, RTPs must meet federal air quality conformity requirements. Failure to comply with conformity requirements will result in some loss of transportation funding.

The transportation system utilized in California is a multi-faceted and multi-modal system for moving people and goods. It includes an extensive network of freeways, highways and roads; public transit; air, rail and sea routes; and nonmotorized modes of travel (walking and biking). The routes of travel to move people and goods are briefly summarized below.

1. Freeways, Highways, and Arterials

There are over 170,000 miles of publicly maintained roads in California, almost 80 percent of which are city and county roads (Caltrans, 1998). The California State Highway System is made up of 15,158 miles of roadway; 2,292 miles (15 percent) are Interstate highway, and the remaining 12,866 miles are federal-aid highway. In 1998, the estimated vehicle miles traveled on California's roads was 153 billion miles (Caltrans, 1997).

There are 218 transit operators in California providing transportation services using nine different modes of service to transport 1.1 billion passengers annually. The majority of ridership, 81 percent, is carried by nine transit operators located in the four major metropolitan areas of California—the San Francisco Bay Area, Sacramento, Los Angeles, and San Diego—with riderships of over 20 million annually.

Trucks carry roughly 600 million tons of goods moved within and through California. While truck transport occurs to some extent over the entire 170,000 miles of California's highways and roads, long-haul heavy truck travel is concentrated on California's 7,513-mile portion of the National Highway System.

2. Rail

California is served by two major "Class I" railroads, the Burlington Northern Santa Fe and the Union Pacific. It is also served by some 27 short-line operations that serve as connectors to the major railroads, harbor areas, and intermodal terminals, and that provide service to agricultural and warehousing areas and the timber and resource industries.

Railroads carry about 100 million tons of goods annually. Most of this is interstate trade, since rail is generally only competitive with trucks on trip distances over 500 miles.

3. Maritime

There are 11 major publicly operated seaports and three privately operated seaport areas in California. California's seaports handle about 130 million dry tons of cargo a year and about 200 million tons total. In 1993, the three major ports, Los Angeles, Long Beach, and Oakland, together handled approximately 70 percent of U.S. West Coast seaport trade by value.

4. Air

California's major air cargo facilities are located in Los Angeles, San Francisco, Oakland, and Ontario. Los Angeles International Airport is the third busiest cargo airport in the world, handling more than 1.5 million metric tons of cargo in 1994. San Francisco International Airport (SFO) is the eleventh busiest cargo airport in the U.S. and the nineteenth busiest in the world. In 1994, SFO handled over 687,000 metric tons of air cargo. Oakland International Airport is the third busiest airport for air cargo in California, handling over 497,000 metric tons in 1994. Ontario International Airport is the fourth busiest air cargo airport in California and second busiest in Southern California, handling over 345,000 metric tons.

F. SOLID WASTE/HAZARDOUS WASTE

1. Solid Waste

Solid waste consists of residential wastes (trash and garbage produced by households), construction wastes, commercial and industrial wastes, home appliances and abandoned vehicles, and sludge residues (waste remaining at the end of the sewage treatment process). CCR title 14, Division 7, provides the State standards for the management of facilities that handle and/or dispose of solid waste. CCR title 14, Division 7, is administered by the California Integrated Waste Management Board (CIWMB) and the designated Local Enforcement Agency (LEA). The designated LEA for each county is the County Department of Environmental Health.

CCR title 14, Division 7, establishes general standards to provide required levels of performance for facilities that handle and/or dispose of solid waste. Other requirements included in CCR, title 14, include operational plans, closure plans, and post-closure monitoring and maintenance plans. This regulation covers various solid waste facilities including but not limited to landfills, material recovery facilities (MRFs), transfer stations, and composting facilities.

A total of 188 active Class III landfills are located throughout California, with a total permitted capacity of 220,565 tons per day (CIWMB, 1999a). These facilities are currently permitted to accept municipal solid waste. Based on 1990 data, the CIWMB estimates that tin and steel cans make up 2.83 percent of a typical city's residential waste stream. Empty metal paint cans are a subset of the tin and steel can category, which also includes canned food and beverage containers, empty spray paint and other aerosol containers, and bimetal containers with steel sides and aluminum ends.

In California, it is illegal to dispose of latex paint in the trash or down storm drains or sewer drains (CIWMB, 1999b). According to the California Department of Toxic Substances Control (DTSC), it is also illegal to air dry or mix small amounts of latex paint with any substance for the purpose of solidifying it and disposing of it because this practice is considered "treatment of a hazardous waste." (See below for a discussion of hazardous waste management in California.) However, if latex paint has naturally dried out, it may be disposed of in the trash.

Although empty paint containers can be disposed of in the trash, many local solid waste or household hazardous waste collection programs collect the containers for recycling. A container is considered "empty" if no paint pours out when it is held upside down, any paint remaining in the container cannot be removed by chipping or scraping, and no propellant is dispensed when the pressure-sensitive valve is pressed down on an aerosol can.

California's permitted disposal facilities accepted over 33 million tons of solid waste in 1998 (CIWMB, 1999c), almost one-third of which was accounted for by Los Angeles County. Most of California's solid waste is sent to 15 large landfills, which accept from 5,000 to 10,000 tons per day. On average, California's landfills have space to continue accepting solid waste for at least 28 more years (CIWMB, 1999d). In addition, the planned Mesquite Regional Landfill in Imperial County has been permitted to accept approximately 600 million tons of waste, which

will allow it to operate upwards of 100 years. Once the facility is operational, it will accept waste from Southern California communities via rail.

2. Hazardous Waste

Hazardous materials are substances with certain physical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed. As defined in CCR title 22, Division 4.5, Chapter 11 , Article 3, hazardous materials are grouped into the following four categories based on their properties: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials) and reactive (causes explosions or generates toxic gases). A hazardous waste is any hazardous material that is discarded, abandoned, or to be recycled. The criteria that render a material hazardous also make a waste hazardous (Health and Safety Code, § 25151). If improperly handled, hazardous materials and wastes can result in public health hazards if released to the soil or groundwater or through airborne releases in vapors, fumes, or dust.

Under the Resource Conservation and Recovery Act (RCRA), the U.S. EPA regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Act (HSWA), which affirmed and extended the concept of regulating hazardous wastes from generation through disposal. HSWA specifically prohibits the use of certain techniques for the disposal of some types of hazardous wastes. Under RCRA, individual states may implement their own hazardous waste programs in lieu of RCRA as long as the state program is at least as stringent as the federal RCRA requirements. U.S. EPA approved California's program to implement federal regulations as of August 1, 1992.

DTSC administers the Hazardous Waste Control Law (HWCL). Under HWCL, DTSC has adopted extensive regulations governing the generation, transportation, and disposal of hazardous wastes. HWCL differs little from RCRA; both laws impose "cradle to grave" regulatory systems for handling hazardous wastes in a manner that protects human health and the environment. Regulations implementing HWCL are generally more stringent than regulations implementing RCRA. HWCL regulations list over 780 hazardous chemicals, as well as nearly 30 more common materials that may be hazardous, and establish criteria for identifying, packaging, and labeling hazardous wastes. They prescribe management practices for hazardous wastes; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous wastes that cannot be disposed of in landfills.

Under both RCRA and HWCL, hazardous waste manifests must be retained by the generator for a minimum of three years. Hazardous waste manifests list a description of the waste, its intended destination, and regulatory information about the waste. A copy of each manifest must be filed with DTSC. The generator must match copies of hazardous waste manifests with certification notices from the treatment, disposal, or recycling facility. Hazardous waste as defined in the Code of Federal Regulations title 40 (40 CFR) 261.20 and CCR title 22, Article 9 (including listed substances, 40 CFR 261.30) is disposed of in Class I landfills. California has enacted strict legislation for regulating Class I landfills (Health and Safety Code,

§§25209 - 25209.7). For example, the treatment zone of a Class I landfill must not extend more than five feet below the initial surface and the base of the zone must be a minimum of five feet above the highest anticipated elevation of underlying groundwater (Health and Safety Code, §25209.1(h)). The Health and Safety Code also requires Class I landfills to be equipped with liners, a leachate collection and removal system, and a groundwater monitoring system (Health and Safety Code, §25209.2(a)). Such systems must meet the requirements of DTSC and the SWRCB (Health and Safety Code, §25209.5).

In California, leftover latex or oil-based paint is considered a hazardous waste and must be managed appropriately. Many local environmental health, solid waste, or public works departments operate household hazardous waste (HHW) collection programs. These programs have been set up to collect, reuse, and recycle leftover paint from households.

Currently, there are three Class I landfills located in California. Chemical Waste Management Corporation in Kettleman City is a treatment, storage, and disposal facility that has a permitted capacity of 10 million cubic yards. At current disposal rates, this capacity would last for approximately 20 years (Hashemian, 1999). Safety-Kleen Corporation has a Class I facility in Buttonwillow, Kern County, with a permitted capacity of 10.7 million cubic yards (not yet constructed). The current remaining capacity is 0.3 million cubic yards. At current disposal rates, this capacity would last for approximately seven years. In addition, treatment services and landfill disposal are available from the Safety-Kleen facility located in Westmorland, Imperial County, with a permitted capacity of 2.6 million cubic yards (not yet constructed) and a current remaining capacity of 0.2 million cubic yards, which is estimated to last for approximately five years (Hashemian, 1999).

Hazardous waste can also be transported to permitted facilities outside of California. The nearest out-of-state landfills are U.S. Ecology, Inc., located in Beatty, Nevada; USPCI, Inc., in Murray, Utah; and Envirosafe Services of Idaho, Inc., in Mountain Home, Idaho. Incineration is provided at the following out-of-state facilities: Aptus, in Aragonite, Utah and Coffeyville, Kansas; Rollins Environmental Services, Inc., in Deer Park, Texas and Baton Rouge, Louisiana; Chemical Waste Management, Inc., in Port Arthur, Texas; and Waste Research & Reclamation Co. in Eau Claire, Wisconsin (SCAQMD, 1996).

G. HAZARDS

Hazards are related to the risks of fire, explosions, or releases of hazardous substances in the event of accident or upset conditions. Hazards are thus related to the production, use, storage, and transport of hazardous materials. Industrial production and processing facilities are potential sites for hazardous materials. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production processes. Examples of hazardous materials used by consumers include fuels, paints, paint thinner, nail polish, and solvents. Hazardous materials may be stored at facilities producing such materials and at facilities where hazardous materials are part of the production processes. Storage refers to the bulk handling of hazardous materials before and after they are transported to the general geographical area of use. Currently, hazardous materials are transported throughout California in great quantities via all modes of transportation including rail, highway, water, air, and pipeline.

1. Hazardous Materials

State law requires detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of to prevent or mitigate injury to health or the environment in the event that such materials are accidentally released. OES enforces these requirements. Federal laws, such as the Emergency Planning and Community-Right-to-Know Act of 1986 (also known as Title III of the Superfund Amendments and Reauthorization Act or SARA) impose similar requirements.

The U.S. Department of Transportation (U.S. DOT) has regulatory responsibility for the safe transport of hazardous materials between states and to foreign countries. U.S. DOT regulations govern all means of transportation, except for those packages shipped by mail. Hazardous materials sent by U.S. mail are covered by U.S. Postal Service (USPS) regulations. U.S. DOT regulations are contained in 49 CFR; USPS regulations are in 39 CFR. Common carriers are licensed by the California Highway Patrol (CHP), pursuant to the California Vehicle Code, §32000. This section requires licensing of every motor (common) carrier who transports, for a fee, in excess of 500 pounds of hazardous materials at one time and every carrier, if not for hire, who carries more than 1,000 pounds of hazardous material of the type requiring placards. Common carriers conduct a large portion of their business in the delivery of hazardous materials.

The CHP and Caltrans have primary responsibility for enforcing federal and State regulations and responding to hazardous materials transportation emergencies. The CHP enforces hazardous materials and hazardous waste labeling and packaging regulations that prevent leakage and spills of material in transit and provide detailed information to cleanup crews in the event of an accident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the CHP. The CHP also conducts regular inspections of licensed transporters to assure regulatory compliance. Caltrans has emergency chemical spill identification teams at 72 locations throughout California.

Pursuant to the Emergency Services Act, California has developed an Emergency Response Plan to coordinate emergency services provided by federal, State, and local government agencies and private persons. Response to hazardous materials incidents is one part of this plan. The Plan is administered by the Office of Emergency Services (OES), which coordinates the responses of other agencies including U.S. EPA, CHP, Department of Fish and Game, the applicable RWQCB, and local fire departments (see California Government Code, §8550).

In addition, pursuant to the Hazardous Materials Release Response Plans and Inventory Law of 1985 (the Business Plan Law), local agencies are required to develop “area plans” for response to releases of hazardous materials and wastes. These emergency response plans depend to a large extent on the business plans submitted by persons who handle hazardous materials. An area plan must include pre-emergency planning of procedures for emergency response, notification and coordination of affected government agencies and responsible parties, training, and follow-up.

Hazardous materials incidents are reported to OES, which compiles and archives the information. The data on accidental hazardous materials releases presented below are based on a database search of the OES Warning Center's Hazardous Material Spills Reports. Even though the record search disclosed these spills, it should be noted that there could have been other spills not reported to OES.

In 1998, 52 hazardous material releases of coatings solvents totaling 5,916 gallons were reported statewide. Also reported were 70 paint and coating product releases, totaling 2,408 gallons. Table III-3 shows reported releases of materials used to formulate coatings.

TABLE III-3
1998 HAZARDOUS MATERIALS RELEASE INFORMATION

Solvent	Reported Incidents	Amount (gallons)
Toluene	3	36
Xylenes	3	43
Methyl ethyl ketone	2	90
Mineral spirits*	2	231
Paint thinner*	13	120
Kerosene*	6	2,602
Naphtha*	3	65
Propylene glycol	1	14
Ethylene glycol	6	632
Methanol	3	1,002
Acetone	5	135
Ethanol	4	400
Texanol	1	546
Total	**52**	**5,916**

* Also referred to collectively as petroleum distillates
Source: Office of Emergency Services, 1999.

2. Human Health

As noted in Table III-4, architectural coatings are currently formulated with toxic substances with a range of adverse human health effects. The actual effects of exposure to coatings solvents, however, depend on such factors as the exposure duration, potency of the solvents of concern, exposure frequency, and other factors.

a. Public Health

The Toxic Air Contaminant Identification and Control Act (Health and Safety Code §§ 39650 *et seq*., Food and Agriculture Code Sections 14021 *et seq*.) established

California's two-phased program to identify and control air toxics. In the first phase (risk assessment), the ARB selects substances for review, considering criteria relating to "the risk of harm to public health, amount or potential amount of emissions, manner of, and exposure to, usage of the substance in California, persistence in the atmosphere, and ambient concentrations in the community" (Health and Safety Code § 39666(f)).

In the risk management phase of the program, the ARB reviews the emission sources of an identified toxic air contaminant (TAC) to determine if any regulatory action is necessary to reduce the risk. The analysis includes a review of controls already in place, the available technologies and associated costs for reducing emissions, and the associated risk.

Also in the risk management phase, the ARB, working closely with the air districts, is responsible for developing control measures for all identified toxic air contaminants except those used as pesticides. Pesticides are evaluated in a similar process by the Department of Pesticide Regulation. Following the ARB adoption of measures to control a specific toxic compound, the districts must adopt equal or more stringent regulations for the stationary sources in their jurisdiction. Regulations to control airborne toxic emissions from mobile sources are the responsibility of the ARB.

The Air Toxics Hot Spots Program (Health and Safety Code §§ 44300-44384) requires facilities to report their air toxics emissions, ascertain health risks, and to notify nearby residents of significant risks. Facilities that pose a significant health risk to the community are required to reduce their risk through a risk management plan.

b. Worker Safety Requirements

The California Occupational Safety and Health Administration (Cal/OSHA) and the Federal Occupational Safety and Health Administration (OSHA) are the agencies responsible for assuring worker safety in the handling and use of chemicals in the workplace. In California, Cal/OSHA assumes primary responsibility for developing and enforcing workplace safety regulations. Under the authority of the Occupational Safety and Health Act of 1970, OSHA has adopted numerous regulations pertaining to worker safety (contained in 29 CFR). These regulations set standards for safe workplaces and work practices, including the reporting of accidents and occupational injuries. Some OSHA regulations contain standards relating to hazardous materials handling, including workplace conditions, employee protection requirements, first aid, and fire protection, as well as material handling and storage. Because California has a federally approved OSHA program, it is required to adopt regulations that are at least as stringent as those found in 29 CFR.

Cal/OSHA regulations concerning the use of hazardous materials in the workplace (detailed in CCR, title 8) include requirements for employee safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces hazard communication program regulations containing training and information requirements, including procedures for identifying and labeling hazardous substances. The hazard communication program also requires that Material Safety Data Sheets (MSDSs) be available to employees and

TABLE III-4
TOXICITY OF CURRENTLY AVAILABLE COATINGS SOLVENTS

Solvent-borne Formulations				
Solvent	**TLV[a] (ppm)**	**PEL[b] (ppm)**	**IDLH[c] (ppm)**	**Health Hazard**
Petroleum distillates (naphtha)	100	400	10,000	Mild irritation; narcosis
Xylenes	100	100	1,000	Mild irritation - eye, nose, throat; narcosis; skin
Toluene	100	200	2,000	Moderate irritation - eye, nose, throat; narcosis: skin; suspect teratogen; mutagen
MEK	200	200	3,000	Mild irritation - eye, nose, throat; narcosis
Ethyl alcohol	1,000	1,000	3,300	Marked irritation - eye, nose, throat, skin; narcosis; reproductive impairment
2-propanol	400	400	12,000	Mild irritation - eye, nose, throat; narcosis
Isobutyl alcohol	50	100	8,000	Mild irritation - eye, nose, throat; suspect carcinogen
1,3,4-trimethyl benzene	25	25	N.A.[d]	Marked irritation - eye, nose, throat, skin; cumulative CNS effects; anemia
Stoddard solvent	100	500	5,000	Narcosis; mild irritant
Waterborne Formulations				
Solvent	**TLV (ppm)**	**PEL (ppm)**	**IDLH (ppm)**	**Health Hazard**
Propylene glycol	10mg/m 3	N.A.		Not determined
Ethylene glycol	50	N.A.	N.A.	Moderate irritation – eye, nose, throat, skin; CNS depression
Methanol	1,000	1,000	3,300	Marked irritation – eye, nose, throat, skin; narcosis; reproductive impairment
2-(2-methoxyethoxy) ethanol	N.A.	N.A.	N.A.	Not determined
EGME	5	25	N.A.	Cumulative CNS; skin; suspect reproductive effects; blood disorders
EGBE	25	50	700	Mild irritation - eye, nose, throat; anemia; skin
EGEE	5	200	N.A.	Cumulative blood damage; moderate irritation of eyes, throat, skin

[a] TLV = threshold limit value; source: American Conference of Government Industrial Hygienists

[b] PEL = permissible exposure limit; source: OSHA

[c] IDLH = immediately dangerous to life and health; source: National Institute for Occupational Safety and Health

[d] N.A. = not available

that employee information and training programs be documented. These regulations also require preparation of emergency action plans (escape and evacuation procedures, rescue and medical duties, alarm systems, and emergency evacuation training).

Both federal and State laws include special provisions for hazard communication to employees in research laboratories, including training in chemical work practices. The training must include instruction in methods for the safe handling of hazardous materials, an explanation of MSDSs, use of emergency response equipment and supplies, and an explanation of the building emergency response plan and procedures. Chemical safety information must also be

available at the workplace. More detailed training and monitoring is required for the use of carcinogens, ethylene oxide, lead, asbestos, and certain other chemicals listed in 29 CFR. Emergency equipment and supplies, such as fire extinguishers, safety showers, and eye washes, must also be kept in accessible places. Compliance with these regulations reduces the risk of accidents and worker health effects.

The National Fire Code (NFC), Standard 45 (published by the National Fire Protection Association) contains standards for laboratories using chemicals that are not requirements, but are generally employed by organizations in order to protect workers. These standards provide basic protection of life and property in laboratory work areas through prevention and control of fires and explosions, and also serve to protect personnel from exposure to non-fire health hazards. While NFC Standard 45 is regarded as a nationally recognized standard, the California Fire Code (24 CCR) contains State standards for the use and storage of hazardous materials and special standards for buildings where hazardous materials are found. Some of these regulations consist of amendments to NFC Standard 45. California Fire Code regulations require emergency pre-fire plans to include training programs in first aid, the use of fire equipment, and methods of evacuation.

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